Western Arctic Shelf-Basin Interactions (SBI)

Phase II Field Project

Program Solicitation

NSF 01-78

OFFICE OF POLAR PROGRAMS

FULL PROPOSAL DEADLINE(S): May 30, 2001

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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Western Arctic Shelf-Basin Interactions (SBI)

Synopsis of Program: The SBI project focuses on shelf, shelf break and upper slope water-mass and ecosystem modifications, material fluxes and biogeochemical cycles. The geographical focus is on the Chukchi and Beaufort seas and adjacent upper slopes and the ultimate generalization of these results into Pan-Arctic and global models. An accumulated body of research indicates that climate change will significantly impact the physical and biological linkages between the Arctic shelves and adjacent ocean basins. SBI will therefore focus on the outer shelf, shelf break and upper slope, where it is believed that key processes control water mass exchange and biogeochemical cycles, and where the greatest responses to climate change are expected.

The SBI project is progressing in three phases over a 10-year period. Phase I (1998-2001) is in progress and involves analyses and syntheses of historical data, opportunistic field investigations, and limited regional surveys. This Solicitation calls for proposals for work under SBI Phase II. This phase will constitute the core field program, which is to take place in the Bering Strait region and over the outer shelf, shelf break and upper slope of the Chukchi and Beaufort seas.

Cognizant Program Officer(s):

- Michael Ledbetter, Arctic System Science, Program Director, Office of Polar Programs, 755, telephone: (703) 292-7432, e-mail: mledbett@nsf.gov.
- Dennis Conlon, Office of Naval Research, telephone: (703) 696-4720, e-mail: conlond@onr.navy.mil.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.078 --- Office of Polar Programs

ELIGIBILITY INFORMATION

- **Organization Limit:** None
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 15-25 total
- **Anticipated Funding Amount:** $17,000,000 for FY2002 to FY2006 pending availability of funds.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Full Proposals:** Supplemental Preparation Guidelines
    - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Deadline/Target Dates

- **Letters of Intent (*optional*):** None
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):** May 30, 2001

D. FastLane Requirements

- **FastLane Submission:** Full Proposal Required
- **FastLane Contact(s):**
    - Alicia Shields, OPP, 755, telephone: (703) 292-7423, e-mail: ashields@nsf.gov.

PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for further information.

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

TABLE OF CONTENTS

I. INTRODUCTION

The National Science Foundation, in collaboration with the Office of Naval Research, announces an opportunity for funding under Phase II of the Western Arctic Shelf-Basin Interactions (SBI) project. This project is part of the Ocean-Atmosphere-Ice Interactions (OAII) component of NSF's Arctic System Science Program. The goal of the SBI project is the improvement of our ability to assess impacts of global change on the physical and biological connections among the western Arctic shelves, slopes and deep basins.

The SBI project focuses on shelf, shelf break and upper slope water mass and ecosystem modifications, material fluxes and biogeochemical cycles. The geographical focus is on the Chukchi and Beaufort seas and adjacent upper slopes. An accumulated body of research indicates that climate change will significantly impact the physical and biological linkages between the Arctic shelves and adjacent ocean basins. SBI will therefore focus on the outer shelf, shelf break and upper slope, where it is believed that key processes control water mass exchange and biogeochemical cycles, and where the greatest responses to climate change are expected to occur.

The SBI project is progressing in three phases over a 10-year period. Phase I (1998-2001) is in progress and involves analysis and synthesis of historical data, opportunistic field investigations, and modeling of specific regions and processes. This Solicitation calls for proposals under SBI Phase II. This phase will constitute the field program, which is to take place in the Bering Strait region and over the outer shelf, shelf break and upper slope of the Chukchi and Beaufort seas. A planned future phase III will focus on development of Pan Arctic models suitable for simulating scenarios of the impacts of climate change on shelf-basin interactions.

The SBI field program will focus on:

- Physical modifications of North Pacific and other waters on the Chukchi shelf and slope, and exchanges of these waters across the shelf and slope.

- Biogeochemical modifications of North Pacific and other waters over the Chukchi and Beaufort shelf and slope areas, with an emphasis on carbon, nutrients, and key organisms that represent the suite of trophic levels.

- Comparative studies over the wide Chukchi and narrow Beaufort shelves and adjacent slopes to facilitate extrapolation and integration of the Western Arctic work to a Pan-Arctic perspective. Integrated process and modeling studies of shelf-basin exchange processes and their sensitivity to global change will be an important methodology in this extrapolation. Physical-Biological coupled models are highly desirable.

Through integrated field and modeling efforts, the SBI project will investigate the effects of global change on production, cycling and shelf-slope exchange of biogenic matter, both seasonally and spatially. To this end, there are five study objectives deemed both timely and essential to an improved understanding of the effects of global change on productivity as it contributes to shelf-basin interactions within the Arctic Ocean ecosystem, including

investigating:

1. Understanding the roles of physical processes in the transport and modification of water and biogenic materials across the shelf and into the interior basin;

2. Identification of mesoscale oceanographic features that support locally elevated concentrations of benthic and pelagic biota;

3. Quantification of upper ocean (water column and sea ice) primary productivity in relation to the biomass and diversity of benthic and pelagic primary and secondary consumers;

4. Assessment of the relative importance of top-down as compared to bottom-up controls over pelagic-benthic coupling, biotic complexity, and carbon partitioning among different trophic levels; and

5. Assessment of food web changes consequent to the impacts of changing ice cover and hydrographic parameters on remineralization of organic matter, recycling efficiency and biogeochemical fluxes.

More details on specific physical, biogeochemical and biological hypotheses are outlined in the SBI Science and Implementation plans available on the SBI webpage (http://utk-biogw.bio.utk.edu/SBI.nsf).

Other projects, both domestic and foreign, may address SBI objectives or provide the opportunity for synergistic studies addressing SBI goals. Current moorings are deployed in Bering Strait as part of an ongoing US program, and these moorings provide both data and platforms for deployment of additional instrumentation during SBI Phase II. Examples of foreign projects include the ongoing Japanese (JAMSTEC) and pending Canadian (CASES) projects in the region. Proposals related to these foreign projects should not be submitted in response to this announcement, however, proposals to utilize platforms or moorings provided through those projects will be entertained. Proof of the collaborative nature of the project should be submitted.

II. PROGRAM DESCRIPTION

The SBI Phase II Field Implementation Plan (http://utk-biogw.bio.utk.edu/SBI.nsf) outlines a combination of seasonal hydrobiochemical surveys in support of major biogeochemical, biological and physical process studies as well as modeling efforts, at appropriate time and space scales. Mesoscale, interdisciplinary survey and process studies conducted across the shelf and slope regions during various seasons will be critical for understanding biogeochemical and physical processes occurring over time and space scales relevant to interpreting annual and interannual change in the system. Standard hydrobiochemical measurements on each cruise will constitute the core measurements program within SBI and is considered a "service program" in support of the biological direction of the SBI project. Interdisciplinary mooring arrays should be coordinated with process studies.

A special need of the SBI project is for physical and biogeochemical process studies to be well coordinated. A set of "in-place" domestic and foreign mooring arrays, in combination with any proposed moorings as part of this solicitation, constitute the "SBI mooring network." Moored time-series arrays as part of the SBI mooring network are available for instrumentation proposals

to add equipment to the array that will enhance biogeochemical investigations of the flow characteristics into the study area through Bering Strait as well as the exchanges at the shelf-slope interface.

SBI FIELD PROGRAM

The SBI Phase II field program (Table 1) will include four process-oriented cruises in May/June and July/August 2002 and 2004. Alternate years, 2003 and 2005, will include reduced field programs for critical time-dependent measurements essential for interpreting processes relevant to shelf-basin interactions and ecosystem response. Annual fall cruises will occur in September/October, and will provide an opportunity for emplacement of new SBI time series moorings into the SBI mooring network and underway surveys. A final synthesis year will follow the 4-year field program, thus 5-year proposals are suggested. The following section outlines the SBI field program, both survey and process studies, and more complete information can be found in the SBI Implementation Plan posted on the SBI webpage: (http://utk-biogw.bio.utk.edu/SBI.nsf).

The sampling plans listed below for the SBI field program are based on the following parameters (refer to the schematic map on the SBI web page for the study location):

- estimated two week transit time from Dutch Harbor to Bering Strait and return, inclusive of scientist change-out in Nome or Barrow, Alaska;
- either 14-day (survey) or 30-day (process) sampling in the operating area indicated by the transects outlined in the intense study region for the SBI project (see Implementation Plan);
- station depths from 50-1000 meters;
- an average station spacing of 10 nautical miles in the intensive study area;
- inclusion of brief single cast stations at 30 nautical mile intervals on the transect from Bering Strait to the intense blue area each cruise;
- estimated 10 stations/day (survey) or 5 stations/day (process), inclusive of between station transit times for each cruise;
- average one hour station time (survey) or about 5 hour station time (process) [note process station times likely variable depending on need of funded proposals];
- both process and reduced survey cruises include core hydrobiochemical measurements using a 12 bottle rosette system.

Ship Support

The 4-year SBI II field program will undertake ship operations in 2002-2005, using the USCGC Healy for process and "service measurements" in even years (2002 and 2004) and other vessels (e.g., *Polar Star*, *Polar Sea* or ships of opportunity) in the odd number years (2003 and 2005).

Additional ship of opportunity platforms, such as Japan's ice-strengthened ship *Mirai*, Canada's icebreakers *Sir Wilfrid Laurier* and *Louis St. Laurent*, and possible Russian and Chinese ships may also be available to support the goals of the SBI project. Moorings emplacements will be done by the *Alpha Helix* or other appropriate vessels but probably not on the USCG Healy. The tentative planned ship use schedule is:

Table 1

Year	Date	Activities	Length
2002	May-June	Process-oriented cruise; "service measurements"	6 weeks
	July-Aug.	Process-oriented cruise; "service measurements"	6 weeks
	Sept.	Bering Strait mooring turnaround; emplace new moorings	4 weeks
2003	Feb.- Mar.	Possible ice camp measurements	6 weeks
	May-June	"Service measurements"	4 weeks
	July-Aug.	"Service measurements"	4 weeks
	Sept.	Mooring turn-around; coring	4 weeks
2004	Feb.-Mar.	Possible ice camp measurements	6 weeks
	May-June	Process-oriented cruise; "service measurements"	6 weeks
	July-Aug.	Process-oriented cruise; "service measurements"	6 weeks
	Sept.	Mooring turn-around	4 weeks
2005	May-June	"Service measurements"	4 weeks
	July-Aug.	"Service measurements"	4 weeks
	Sept.	Pull out moorings	4 weeks
2006		Synthesis	

Time Series Moorings

Collaboration between scientists interested in deploying time series moorings and those interested in pursuing process studies are encouraged. This collaboration should result in proposals that integrate mooring and process activities that justify the placement of the moorings and that show how the proposed research will meet SBI objectives. The "SBI mooring network" includes two Bering Strait moorings that will be maintained under separate ONR funding as an "in-place" program, so interested people can propose to place biochemical sensors and sampling devices on these moorings as part of the SBI Solicitation. In addition, four funded, foreign-supported moorings are available for additional biogeochemical instrumentation in the Beaufort Sea as part of the SBI mooring network. These four currently funded moorings include two JAMSTEC (Japan Marine Science and Technology Center)-sponsored moorings and two Canadian-sponsored moorings (DFO: Department of Fisheries and Oceans). Both currently have standard physical oceanographic instrumentation on them. The revised SBI field map within the

SBI Implementation Plan provides a schematic of the currently maintained moorings for the SBI mooring network, as well as suggestions of possible SBI Phase II and "in-place" mooring sites. Any proposed time series moorings should accomodate coincident physical and biochemical measurements, such as: ice-thickness, current velocity, temperature, salinity, light transmission, chlorophyll and nutrient sensors. These moorings should have the capability of accepting other samplers and sensors as well. For information on points of contact for ONR-supported and international moorings refer to the Implementation Plan.

Categories of Proposal

Two categories of proposal are requested. Proposers may submit both categories of proposal, but the submissions must be separate.

Category 1 proposals will encompass process-oriented research activities that will utilize the cruises listed in Table 1, along with appropriate modeling, mooring, underway surveys, and remote sensing activities, to address the program objectives. Proposals should not include duplication of measurements to be provided to all participants through the Category 2 proposals.

Category 2 proposals will address the acquisition of a consistent suite of data from cruises indicated in Table 1, and work proposed as Category 2 will be considered a "service measurements" function rather than a scientific function. Data to be collected include CTD-based temperature, salinity, dissolved oxygen concentration, transmisivity, fluorescence and photosynthetically active radiation (PAR). Additional data will include inorganic nutrients (nitrate, phosphate, silicate and ammonia), chlorophyll-a, salinity and dissolved oxygen concentrations determined from discrete water samples obtained using a rosette. Underway (sea chest) temperature and salinity data will be logged, as will standard meteorological observations. Acoustic Doppler Current Profiler (velocity and backscatter) data should be recorded. A plan for recording all underway measurements made by Category 1 proposers should also be included. Specifications for the USCG icebreaker Healy are given at: http://www.uscg.mil/pacarea/healy/. Insofar as possible, data will be provided to all scientific participants upon their departure from the vessel at the completion of each cruise leg. All data will be provided to all program participants in a readily accessible format (e.g., a CD-ROM or website) within 2 months following cruise completion.

For estimation purposes the following "service measurements" are anticipated:

1) Hydrographic sampling planning information during "service measurement"-only cruises in 2003 and 2005 (see Table 1):

- 20 brief one cast stations from Bering Strait to primary SBI study region;
- 120 stations/cruise in intense sampling area;
- one CTD rosette cast per station in the intense sampling area;
- estimated 10 stations per day.

The average daily sample load in the intensive area, based on 120 core samples/day are:

1. 120 nutrient samples (nitrate, nitrate, phosphate, silica and ammonia)

2. 120 chlorophyll samples
3. 25 bottle salinities
4. 75 dissolved oxygen determinations.

2) Hydrographic sampling planning information during two process cruises each year in 2002 and 2004 (see Table 1):

- 20 brief one cast stations from Bering Strait to primary SBI study region;
- 120 stations/cruise in intense sampling area;
- on average, 4 casts/station in the intensive sampling area, including one CTD rosette cast for core measurements and the other 3 casts for primary productivity and process experiments;
- estimated 5 stations per day.

The average daily sample load in the intensive area, based on 60 core samples/day, plus estimated support for primary productivity and process experiments are:

1. 120 nutrient samples (nitrate, nitrate, phosphate, silica and ammonia) [core, plus experimental support samples];
2. 120 chlorophyll samples [core, plus experimental support samples];
3. 25 bottle salinities;
4. 75 dissolved oxygen determinations.

Coincident Domestic and Foreign Projects

Proposers should be aware that other collaborating projects, either domestic or international, may also partially address SBI goals and objectives as outlined in the SBI Science and Implementation plans. Examples of these projects include Russian/other international projects in the Chukchi Sea and Canadian/other international projects in the Beaufort Sea, such as the ongoing JAMSTEC and Canadian Department of Fisheries and Oceans projects, and the pending Canadian Arctic Shelf Exchange Study (CASES) project. SBI support from NSF is not intended for studies addressing the goals of these projects but, rather, for projects that address exclusively the goals of SBI. Additional information on international projects may be found in the Implementation Plan.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the Grant Proposal Guide are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

It is anticipated that $17 million will be available in FY 2002 to FY 2006 to support a total of 15-25 awards. Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: http://www.nsf.gov/cgi-bin/getpub?nsf012. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

The SBI Phase 2 field program will be implemented as a fully integrated, interdisciplinary research project. Therefore, proposal submissions in Category 1 from interdisciplinary, collaborative teams of researchers are strongly encouraged. Each Category 2 proposal is expected to include all of the measurements listed as "service measurements". Collaborative proposals submitted from different institutions in either category should follow the guidelines for submission as described in the NSF Grant Proposal Guide (NSF 01-2).

Proposers of Category 1 proposals are required to outline shiptime requirements (e.g. station time, small boats, aviation) as well as deck and laboratory space, sampling and laboratory equipment requirements. Information about the USCG icebreaker Healy specifications may be found at: http://www.uscg.mil/pacarea/healy/.

Proposals must include, in the project description, an explicit data management and submission plan that conforms with the SBI data management plan being coordinated with the UCAR Joint Office of Science Support (JOSS; http://www.joss.ucar.edu/; posted on the SBI webpage). Data management will be mandatory and will follow the ARCSS/OAII guidelines that are listed on the SBI and OAII webpages. Inclusion of a specific data management plan is a required component of all submitted research proposals . The coordination with JOSS will allow streamlined PI data management, with ultimate long-term data archiving through the ARCSS Data Coordination Center (ADCC) at the National Snow and Ice Data Center (NSIDC). Attendance at annual SBI PI and biennial OAII national meetings should be budgeted for in the individual proposals. The SBI Implementation Plan, SBI Science Plan and SBI Data Policy are available on the SBI [http://www.utk-biogw.bio.utk.edu/SBI.nsf], and OAII [http://arcss-oaii.umces.hpl.edu] web pages. Hard copies may be obtained by writing to Holly Kelly, SBI Project Office, Department of Ecology and Evolutionary Biology, 569 Dabney Hall, The University of Tennessee, Knoxville, TN 37996, USA.

Proposers are reminded to identify the program solicitation number (NSF 01-78) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost sharing is not required in proposals submitted under this Program Solicitation.

C. Deadline/Target Dates

Proposals must be submitted by the following date(s):

Full Proposals *by 5:00 PM local time*: May 30, 2001

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: http://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call 1-800-673-6188.

Submission of Signed Cover Sheets. The signed copy of the proposal Cover Sheet (NSF Form 1207) must be postmarked (or contain a legible proof of mailing date assigned by the carrier) within five working days following proposal submission and be forwarded to the following address:

National Science Foundation
DIS – FastLane Cover Sheet
4201 Wilson Blvd.
Arlington, VA 22230

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education
One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities
Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria

Proposers should carefully read the SBI Science Plan and SBI Implementation Plan before preparing proposals. Proposers should explain how their efforts closely match the goals set forth in these two plans. In order to maximize coordination of inderdisciplinary activities during the field program, proposals will be reviewed for the level of integration with other SBI Phase 2 research. To facilitate the coordination required for conducting the interdisciplinary field program, NSF may request proposers of projects selected for possible support to attend a coordination meeting at NSF to facilitate the planning of a coordinated field program and begin finalization of the SBI Phase 2 Implementation Plan.

Additional information for proposers:

For examples of activities that address the standard review criterion, "What are the broader impacts of the proposed activity," proposers are encouraged to consult the report of the OPP Advisory Committee on this topic. The document is available from OPP Program Officers.

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by

the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise

communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at http://www.nsf.gov/cgi-bin/getpub?gpm. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at http://www.gpo.gov.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Western Arctic Shelf-Basin Interactions should be made to:

- Michael Ledbetter, Arctic System Science, Program Director, Office of Polar Programs, 755, telephone: (703) 292-7432, e-mail: mledbett@nsf.gov.
- Dennis Conlon, Office of Naval Research, telephone: (703) 696-4720, e-mail: conlond@onr.navy.mil.

For questions related to the use of FastLane, contact:

- Alicia Shields, OPP, 755, telephone: (703) 292-7423, e-mail: ashields@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at http://www.nsf.gov/cgi-bin/getpub?gp. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF web site at http://www.nsf.gov/home/ebulletin, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's Custom News Service (http://www.nsf.gov/home/cns/start.htm) to be notified of new funding opportunities that become available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

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